IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Neyer et al.	Examiner:	L. Senengus
Serial No.:	09/286,522	Group Art Unit:	3641
Filed:	April 6, 1999		
For:	A DISARMABLE FIRING MODULE		

AFFIDAVIT UNDER 37 CFR Section 1.131

STATE OF OHIO)
: ss.:
COUNTY OF Butler)

I, Barry T. Neyer being duly sworn depose and say:

That I am the principle inventor for the above-identified patent application;

That we conceived in the United States the invention claimed in the above-identified patent application prior to November 26, 1997, the filing date of the cited U.S. Patent No. 5,969,286 to Ward et al.

Exhibit A attached hereto is evidence of our conception of the invention claimed in the subject patent application.

We also reduced to practice in the United States, the invention claimed in the above-identified patent application prior to November 26, 1997, the filing date of the cited Ward et al. patent as also shown in Exhibit A.

Exhibit A which relates to the aforementioned conception and actual reduction to practice corresponds to the invention broadly disclosed and claimed in the above-identified patent application.

Further deponent saith not.

Barry T. Neyer

Sworn and subscribed to before me this

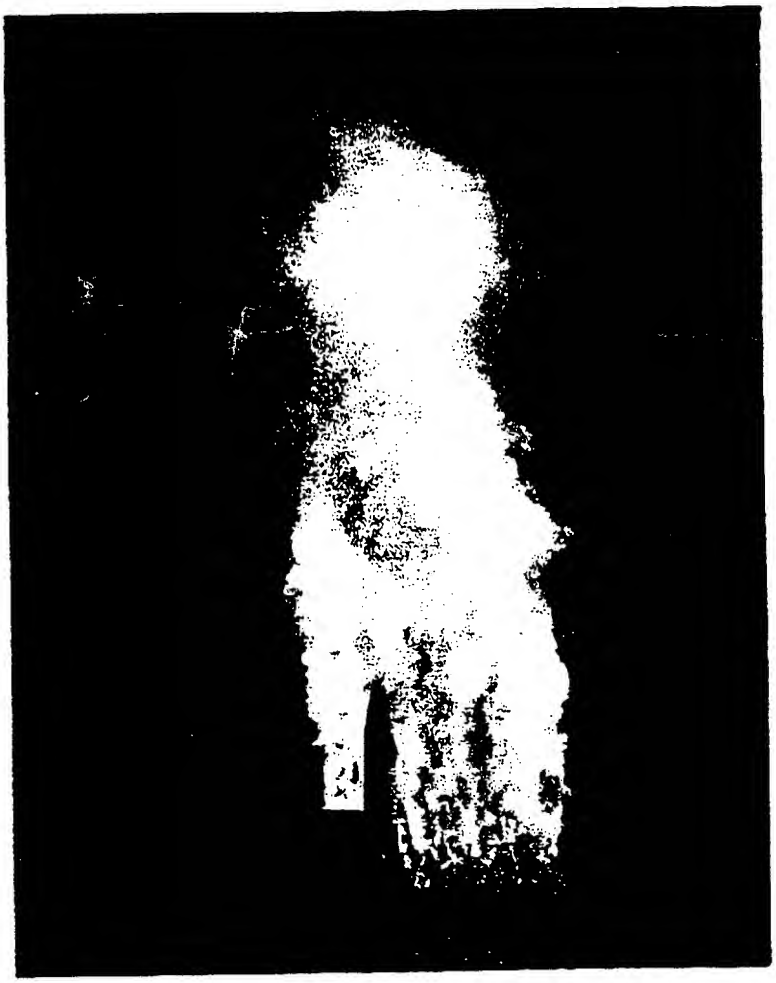
5th day of December, 2000.

Nola K Ferguson
Notary Public

NOLA K. FERGUSON
Notary Public, State of Ohio
My Commission Expires
November 2, 2004

EG&G Electro-Optics

"echnology Symposium for High Energy Switches and Electro-Explosive Systems



13-15 August 1996

A NEW GENERATION OF S&A SYSTEMS EMPLOYING MICRO-MACHINED DEVICES

High Energy Switch and Electro
Explosive Systems Symposium
Salem, MA
14-15 August, 1996

Dan Knick
EG&G Star City

Why choose an ESAD over conventional Electro-Mechanical S&A systems ?

- Enhanced performance, improvement in arming time tolerance
- Establish and growing manufacturing base, COTS
- Projected cost savings
- High reliability from solid state electronics, MEMS technology
- Weight and size reduction
- Disarming feature
- All secondary explosives
  - Increased handling safety
  - More environmentally compliant, No "lead" azide on styphinate

ESAD Sequence of Events

- 1. INTENT TO LAUNCH:
  - ESAD power-up, acquire and store accelerometer offset (300 mSec)
- 2. SEPARATION:
  - Begin to monitor missile acceleration
- 3. SAFE SEPARATION DISTANCE ACHIEVED:
  - Firing and trigger capacitors charged
- 4. IMPACT DETECTED:
  - Function EFI
- 5. TIME WINDOW EXPIRED:
  - Firing circuits disarmed

ESAD Electrical Safety Design Requirements

- Minimum of Two Independent electrical safety features:
  - Intent to launch, irreversible power to ESAD.
  - Post launch environment, accumulate acceleration data.
- Enabling safety features:
  - One dynamic feature and two static features.
- No common mode failures:
  - Dissimilar components and different manufacturers.
- No single point failures:
  - Safety modules don't share components.
- Physical partitioning:
  - Utilize barriers to isolate safety modules.
  - Utilize dissimilar designs.
- All secondary explosive train

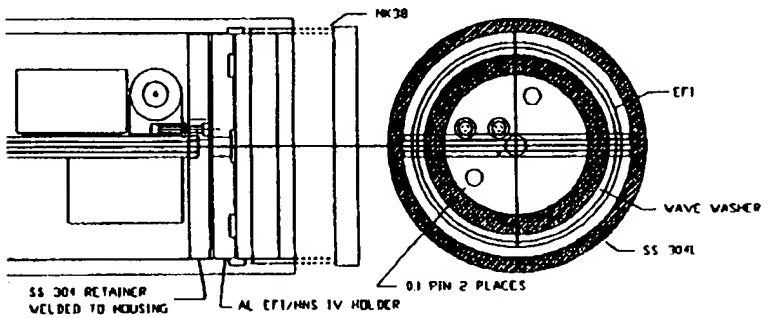
ESAD Safety And Design Approach

- **SAFETY FEATURES**
  - Utilize in-line secondary explosive train with EFI and HNS IV
  - Inhibit charging of firesct until safe separation distance is achieved
  - Firing circuits enabled by post launch environment (acceleration)
  - All energy derived from thermal battery after launch
  - Automatic safing with time-out or power loss
- **DESIGN FEATURES**
  - Utilize Micro-Machined Accelerometer to provide more more accurate arming distance
  - Utilize COTS components
  - New design to be a drop-in replacement
  - Design-in full function testability

ESAD Safety and Design Approach

- Hermetically sealed electronics package
- Easily removable explosives
- Monitor and test points available at input connector.
- Investigating built-in current monitor.

Proposed EFI Configuration and Connection Technique



Why Use an EFI?

- Uses Only Secondary Explosives (typically HNS)
- Well-understood Initiation Mechanism
- EFI can be characterized and evaluated apart from H.E. (VISAR and Streak Camera)
- Requires a Unique, Fast, High Voltage Pulse for Initiation
- EFIs Can be made with High Functional Reliability (2000 shots without a failure)